

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of the claims in the application:

**Listing of Claims:**

1. (currently amended): Reactor for carrying out photocatalysed reactions in liquid or gaseous reaction media, ~~consisting of~~comprising:
  - a reactor vessel with a solid photocatalyst;<sub>i</sub>
  - feed lines and take-off lines;<sub>i</sub>
  - mixing means;~~and~~<sub>i</sub>
  - a means of supplying electromagnetic radiation;<sub>i</sub> and  
~~characterized in that phosphorescent particles are present which are~~microradiators  
suitable for absorbing the electromagnetic radiation and, with a time delay, for emitting light which excites the photocatalyst.
2. (currently amended): Reactor according to Claim 1, ~~characterized in that the radiation source~~wherein the means of supplying electromagnetic radiation is mounted on a radiation-transparent wall or in the interior of the reactor vessel and the mixing means is suitable for conveying the ~~phosphorescent particles~~microradiators from the interior of the reactor vessel to the radiation source and back.
3. (currently amended): Reactor according to Claim 1, ~~characterized in that the~~wherein the means of supplying electromagnetic radiation is composed of a lamp and a fluid channel which communicates with the reactor vessel via transport lines and conveying means for the ~~phosphorescent particles~~microradiators.
4. (currently amended): Reactor according to Claim 3, ~~characterized in that~~wherein the lamp is of rod-shaped design and is surrounded by the fluid channel in the form of a jacket.

5. (currently amended): Reactor according to Claim 3 or 4, characterized in that, wherein the reactor vessel is provided with means for separating the phosphorescent particles microradiators from the photocatalyst and/or from the reaction medium.

6. (currently amended): Reactor according to ~~Claims 1 to 5~~, Claim 1, suitable for the oxidation of organic impurities in water or wastewater, ~~characterized in that~~wherein feed lines are provided for air or oxygen and exhaust lines for the waste gases.

7. (currently amended): Reactor according to ~~Claims 1 to 6~~, characterized in that Claim 1, wherein the reactor vessel is a fluidized bed reactor, a continuous-flow or tube reactor, a fixed bed reactor or a stirred tank reactor.

8. (currently amended): Reactor according to ~~Claims 1 to 7~~, characterized in that Claim 1, wherein the photocatalyst ~~have~~has a particle diameter of from 1 nm to 100  $\mu\text{m}$  in suspension reactors or from 1  $\mu\text{m}$  to 1 mm in fluidized-bed reactors or fixed-bed reactors.

9. (currently amended): Reactor according to ~~Claims 1-8~~, characterized in that the phosphorescent particles Claim 1, wherein the microradiators have a phosphorescence half-life of from 5 seconds to 30 minutes and a particle size of from 1 nm to 1 mm, ~~preferably from 10  $\mu\text{m}$  to 0.5 mm.~~

10. (cancelled)

11. (currently amended): ~~Phosphorescent particles~~Microradiators according to Claim 40, ~~characterized in that~~21, wherein the support consists of magnetic material.

12. (currently amended): ~~Phosphorescent particles~~Microradiators according to ~~Claims 10 or 41~~, characterized in that 21, wherein the support is covered with a radiation-transparent layer.

13. (cancelled)

14. (currently amended): Process according to Claim 13, ~~characterized in that~~ 23, wherein after emitting their energy the phosphorescent particles are conveyed past the radiation source again and recharged.

15. (currently amended): Process according to Claim 14, ~~characterized in that the phosphorescent particles wherein the microradiators~~ are separated from the photocatalyst and/or from the reaction medium before being passed to a separate radiation source and activated, before being then passed back into the reaction medium.

16. (currently amended): Process according to ~~Claims 13 to 15, characterized in that~~ Claim 23, wherein the photocatalytic reaction is an oxidation of organic compounds in aqueous solution.

17. (currently amended): Process according to ~~Claims 13 to 16, characterized in that~~ Claim 23, wherein the catalyst is  $\text{TiO}_2$  particles and the ~~phosphorescent particles~~ microradiators are glass particles which have been doped with rare earth elements and can be excited with UV light or visible light.

18. (new): Reactor according to Claim 2, wherein the reactor vessel is provided with means for separating the phosphorescent particles from the photocatalyst and/or from the reaction medium.

19. (new): Reactor according to Claim 4, wherein the reactor vessel is provided with means for separating the microradiators from the photocatalyst and/or from the reaction medium.

20. (new): Reactor according to Claim 9, wherein the microradiators have a particle size of from 10  $\mu\text{m}$  to 0.5 mm.

21. (new): Microradiators for use in reactors for carrying out photocatalysed reactions in liquid or gaseous reaction media, said reactor comprising a reactor vessel with a solid photocatalyst, feed lines and take-off lines, mixing means, and a means of supplying electromagnetic radiation, wherein the microradiators are suitable for absorbing the supplied electromagnetic radiation and, with a time delay, for emitting light which excites the

photocatalyst, said microradiators consisting of a phosphorescent material which has been applied to a support having a particle size of from 1 nm to 1 mm.

22. (new): Microradiators according to Claim 11, wherein the support is covered with a radiation transparent layer.

23. (new): Process for carrying out photocatalytic reactions, comprising the steps of:

- a) providing solid photocatalysts;
- b) suspending the photocatalysts in a liquid or gaseous reaction medium or applying them to a surface;
- c) providing microradiators which are charged up at an electromagnetic radiation source and which emit this energy with a time delay; and
- d) activating the photocatalysts by means of the microradiators.